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A Look at British Education

TV and the Science Teacher

OCTOBER 11, 1961

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THE OHIO STATE UNIVERSITY

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Educational Research Bulletin

OCTOBER 11, 1961
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The Balance of Education

By D. ELLEN BEINHORN

> To distinguish peculiarities of talent is absolutely necessary . . . . We must so far accommodate ourselves . . . to feeble intellects, that they may be trained only to do that which nature invites them . . . . But if richer material fall into our hands . . . no rhetorical excellence must be left unstudied.

THE educational ideal—equality between education for the few, or gifted, and education for the rest—is as relevant to nations and peoples practicing universal secondary education today as it was in 88 A.D. when the Roman rhetorician Quintilian searched for the absolute answer to the balance of education. To bring about a state of equilibrium between the kinds of education required for all children is a desire shared by many countries. The ways in which different nations strive for this ideal result in different emphases and produce diverse and sometimes common problems.

In England, for example, secondary education has been and continues to be pre-eminently education of the intellectual elite, and problems there center mainly on what to do for average children. British education, in giving the able child a most favorable chance to develop, practices selection and segregation into a tripartite arrangement in the state schools and in an effective network of independent schools. Thus having attained a satisfactory position in respect to the gifted child, the main consideration in England at present is how to deal with the average pupil.

Conversely, in America a new and different pattern has developed, providing for a greater accent on education for the majority with problems arising over the academic attainments of the

EDITOR'S NOTE. This article was adapted from the author's dissertation completed for the B. Litt. degree at Oxford University in 1959. The document, "Classification in Secondary Education in England and America with Special Reference to More Able Children," is on file in the Bodleian Library at Oxford.

gifted child. The main concern in the United States is to establish a practical basis for the education of more able children and to do so within the present framework of American education.

By examining the educational results of a country that has specialized in the area which is our main weakness, we can perhaps shorten our periods of experimentation as we explore programs for academically talented children; we may even avoid some of the mistakes made in the English system. Some questions significant to our own further development in this area are: What effect has a system partial to the gifted child had on the average child? Has the British system of education, based on selection and segregation, been able to produce adequate education for all children?

There has been no scientific research in recent years to disclose whether the English system of education actually produces superior educations for gifted children compared with the educational system in the United States. Nevertheless, comparative studies of education generally credit an academic advantage to the English student; in fact, it has become almost a platitude that he is two years ahead of his American counterpart. Does this mean that all English students, irrespective of native ability and type of school attended, are two years ahead of American students? This notion seems highly improbable.

A three-year study was made at the University of Oxford in order to determine whether English children are or are not academically advanced and to ascertain the degree of deviation in either direction. One phase of this study, a program of evaluation by means of tests, is reported here. Because the study was an individual effort, the sampling was necessarily limited. The work was designed mainly as a pilot investigation in order to locate specific points where more extensive testing would offer conclusive evidence concerning the issues involved. On the basis of the entire study, however, it seems that the results of this survey should serve as accurate indicators of trends in English education as a whole.

AT THIS point a brief examination of the English educational system seems to be necessary. Mention has been made previously of English selection and allocation into a tripartite arrangement at the secondary-school level. Students are assigned to grammar schools, secondary technical schools, or secondary mod-

ern schools according to their age, ability, and aptitude as determined by selective examinations. A brief description of each of these classifications follows:

Grammar Schools offer an academic education which can lead to the university and the professions. It follows that this is the education prescribed for the more able boys and girls. The state-maintained grammar schools and the independent schools come under this category.

TABLE I
DISTRIBUTION OF PUPILS IN SECONDARY SCHOOLS IN ENGLAND AND WALES IN 1956*

Type of School	Number of Pupils	Per Cent
(1)	(2)	(3)
Secondary Modern	1,340,591	56.5
Technical	90,745	3.7
Bilateral	52,542	2.2
Multilateral	1,557	Less than 1.0
Comprehensive	27,315	1.1
All-age	157,465	6.6
Grammar		
Maintained or state	544,119	
Direct-grant	90,814	
Independent	64,060	
Total grammar	698,993	29.4
Total	2,369,208	

* The figures cited here were taken from the 1956 report of the Ministry of Education.

Secondary Technical Schools are for technically minded pupils who desire a practical and applied approach to work closely related to industry, trades, and commerce.

Secondary Modern Schools offer a general education with a practical emphasis. The pupils in this group deal more effectively with concrete things than with ideas.

The existence of these three types of schools—the grammar school to cater to the more able children, the technical school to assist those with a specifically technical bent, and the secondary modern school to instruct the majority of children in a general fashion—apparently was not sufficient for the variety of talents and dispositions of all the nation's youth. The development of other types of schools manifests a dissatisfaction with the tripartite arrangement as a means of educating all English children. The distribution of schools indicating this diversity along with the number of pupils enrolled in each is shown in Table I.

In addition to the tripartite pattern and other types of schools composing the state educational stream is a powerful, but small,

private system of education. The existence of this dual arrangement of education in England is at present the subject of considerable controversy both in educational and political circles.[1]

No fees are paid by the majority of English children who attend schools maintained by local authorities—in other words, the state-supported system of education. Fees are, however, paid by about 5 per cent of the children who are enrolled in privately managed secondary schools approved by the Ministry of Education. The term *public schools* has no exact definition, but a generally acceptable interpretation includes the independent fee-paying schools, a number of the direct-grant schools, and finally a very small number of schools receiving financial aid from local education authorities. That there are differences in the quality of education among these various kinds of schools will be indicated later in an analysis of the testing data. The main point to remember here is that, according to the Ministry's annual report of 1956, pupils who receive selective educations number 29.4 per cent of the total secondary-school population.[2] Thus, because of financial privilege (fee-paying public-school students) or merit (scholarship students), almost 30 per cent were being educated as academically talented students in special schools apart from the mass school population.

THE survey reported here is concerned mainly with the secondary grammar schools under both public and private control. To a lesser extent it deals with the publicly supported secondary modern school attended by the majority of children.

The California Achievement Tests were chosen for this research because of their ability to determine achievement, grade placement, and percentile rank of pupils in relation to the general school population. Further reasons for their selection were that they measured a broad area consisting of reading, mathematics, and English and that they were not designed as speed tests, which would have added another disadvantage to the already existing cultural one for the English children. The children tested were in grades equivalent to the ninth and tenth in the United States.

[1] *See* A. N. Gilkes. *Independent Education: In Defence of the Public Schools.* London: Victor Gollancz, Ltd., 1957.

[2] A. Harry Passow corroborates this finding in a recent monograph on English education: "For England and Wales, probably 30 per cent of the pupils are in a grammar- or technical-school type of program." *Secondary Education for All: the English Approach.* Columbus, Ohio: Ohio State University Press, 1961, p. 47. (International Education Monographs).

The I.Q.'s of the English children selected and the American standardized norms were within two or three points of each other in each testing case. The Moray House 11-plus results[3] were used to obtain a mean score for the English children tested. The achievement tests were therefore used on comparable I.Q. groups.

A total of 645 tests was given, each battery consisting of three separate tests. Two hundred fifteen pupils were tested in six different kinds of schools. Evidence that the children were representative and not a selected group was furnished by statements of verification made by the heads of various schools taking part.

The schools used in the study are as follows:

School A: Boys' independent ("public")
School B: Boys' direct-grant grammar
School C: Girls' maintained grammar
School D: Boys' maintained grammar
School E: Mixed maintained grammar
School F: Maintained secondary modern

All the schools are selective with the exception of the secondary modern (School F), which is representative of the largest group of secondary schools; in 1956 these schools enrolled 56.5 per cent of the total secondary-school population. Schools A and B are classified as independent and/or direct-grant grammar schools while C, D, and E are classified as municipal or state-maintained grammar schools.

Tables II and III report the mean grade-placement scores and corresponding percentile ranks for separate subjects and for the test as a whole. The scores are compared in each table with the California Achievement Tests (CAT) norms for the ninth and tenth grades. In order to illustrate the method of comparison used between the survey test results and the standardized norms, the CAT percentile norms are presented in some detail in Table II.

The table shows the results of testing in the independent private school where twenty-four students were given three tests in three subjects—a total of seventy-two tests. These students had a mean chronological grade placement of 9.6—that is, they were in the sixth month of the ninth grade. The figures in Columns 4 and 5 show the CAT percentile norms in comparison with the standardized population.

The score in reading indicates a mean grade placement of 14.2, thus placing these students at a mean percentile rank of 99.

[3] Particulars of the Moray House Tests may be found in *What Are Moray House Tests?* London: University of London Press, Ltd., 1940.

The average performance for grade 9.6 is located at the 50th percentile in comparison with the standardized population. In reading, consequently, pupils in the independent schools were 4.6 years ahead of average accomplishment.

TABLE II

TEST RESULTS AND CAT GRADE PLACEMENTS AND PERCENTILE NORMS FOR SCHOOL A: AN INDEPENDENT PRIVATE SECONDARY SCHOOL ($N = 24$, MEAN CHRONOLOGICAL GRADE PLACEMENT = 9.6)

SUBJECT	TEST RESULTS		CAT GRADE PLACEMENTS AND PERCENTILE NORMS	
	Mean Grade Placements	Mean Percentile Ranks	Grade Placements	Percentile Norms
(1)	(2)	(3)	(4)	(5)
Reading	14.2	99	13.4+	99
			12.5–13.3	95
			11.9–12.4	90
			11.3–11.8	85
			10.9–11.2	80
			10.6–10.8	75
			9.2– 9.7	50
Mathematics	14.8	99	13.6+	99
			12.9–13.5	95
			12.0–12.8	90
			11.4–11.9	85
			11.0–11.3	80
			10.7–10.9	75
			9.2– 9.7	50
Language	13.8	99	13.5+	99
			12.4–13.4	95
			11.8–12.3	90
			11.3–11.7	85
			10.9–11.2	80
			10.6–10.8	75
			9.2– 9.7	50
Total	14.2	99	13.5+	99
			12.6–13.4	95
			11.9–12.5	90
			11.3–11.8	85
			10.9–11.2	80
			10.6–10.8	75
			9.2– 9.7	50

Examination of Columns 4 and 5 will show that different grade placements are used by the CAT for each subject. The total mathematics score for the independent school was 14.8, placing those students at the 99th percentile. Here pupils in the independent school demonstrate a performance of 5.2 years beyond the average. This, incidentally, was the highest score made in the testing. The language score was 13.8, again placing the British

students at the 99th percentile with average advanced accomplishment of 4.2 years.

TABLE III

TEST RESULTS AND CAT GRADE PLACEMENTS AND PERCENTILE NORMS FOR REPRESENTATIVE SCHOOLS

SCHOOLS	SUBJECTS	TEST RESULTS		CAT GRADE PLACEMENTS AND PERCENTILE NORMS	
		Mean Grade Placements	Mean Percentile Ranks	Grade Placements	Percentile Norms
(1)	(2)	(3)	(4)	(5)	(6)
School B: Boys' Direct-Grant Grammar School (N=25) (CGP*=9.3)	Reading	13.8	99	13.4+	99
	Mathematics	13.9	99	13.6+	99
	Language	12.9	95	12.4–13.4	95
	Total	13.5	99	13.5+	99
School C: Girls' Maintained Grammar School (N=34) (CGP=9.5)	Reading	12.7	95	12.5–13.3	95
	Mathematics	11.7	85	11.4–11.9	85
	Language	12.4	95	12.4–13.4	95
	Total	12.2	90	11.9–12.5	90
School D: Boys' Maintained Grammar School (N=32) (CGP=10.1)	Reading	13.2	90	13.1–13.6	90
	Mathematics	12.4	80	12.2–12.5	80
	Language	12.3	80	12.0–12.4	80
	Total	12.6	85	12.5–13.0	85
School E: Mixed Maintained Grammar School (N=50) (CGP=10.3)	Reading	13.0	85	12.5–13.0	85
	Mathematics	12.5	80	12.2–12.5	80
	Language	12.4	80	12.0–12.4	80
	Total	12.8	85	12.5–13.0	85
School F: Maintained Secondary Modern School (N=50) (CGP=9.3)	Reading	8.1	25	8.1– 8.3	25
	Mathematics	8.2	25	8.1– 8.2	25
	Language	8.0	25	8.0– 8.2	25
	Total	8.2	25	8.1– 8.3	25

* CGP = Mean Chronological Grade Placement.

The total score for the complete battery shows a chronological grade placement of 14.2 and a corresponding percentile rank of 99. Consequently, the students tested in the independent school

displayed an over-all acceleration of 4.6 years beyond average performance based on a standardized form.

THE results of the testing in the remaining schools are shown in Table III. An analysis of the data in these tables indicates significant differences in the test results from school to school.

Students in the boys' direct-grant grammar school, for example, had a mean chronological grade placement of 9.3. Since their mean grade-placement score in reading was 13.8, they were 4.5 years ahead of the standardized norms and at the 99th percentile. Their score in mathematics, 13.9, indicated an acceleration of 4.6 years. Their language score was 12.9—3.6 years ahead of the average group. The total grade-placement score, 13.5, placed them at the 99th percentile with an over-all acceleration of 4.2 years.

Similarly for the girls' maintained grammar school, students were 3.2 years ahead of the average group in reading, 2.2 years ahead in mathematics, and 2.9 years ahead in language. The total score indicated an acceleration of 2.7 years and placement at the 90th percentile.

Students in the boys' maintained grammar school and the mixed maintained grammar school show slightly lower but similar test results. Both groups have an over-all acceleration of 2.5 years and are at the 85th percentile.

In the maintained secondary modern school, however, the test results drop considerably. The scores, ranging from 1.1 years to 1.3 years behind the average, place the students at the 25th percentile.

WHAT essentially do these results add up to? First, they point up how one type of school compares with another in England. The independent school is shown to have the highest performance results, closely followed by the direct-grant grammar school. Among the grammar schools, the largest drop in achievement takes place between the direct-grant and the state-maintained schools. Achievement in the modern school is shown as three years and five months below the lowest grammar-school results and five years and seven months below the private-school results. Thus the variation of achievement among different kinds of English schools is clear. There is considerable disparity between the independent and direct-grant grammar schools in comparison

with the state grammar schools; and an even greater disproportion is found between the grammar schools in general and the secondary modern schools.

Although the results are favorable regarding the accomplishments of English children educated in the grammar schools—that is, the selected children—the opposite is true of pupils educated in secondary modern schools. These children were found to fall one year and one month short of the standardized norms for average American performance. This drop could, in part, be attributed to the previously mentioned fact that the tests were generally alien to the English children; in the case of the secondary modern pupils, it is quite probable that they were even less able to adapt than were the grammar-school students, who were of higher intelligence.

The use of an American test obviously prevents the establishment of any conclusive proofs and points to a need for tests which can overcome cultural differences in order to carry out scientific comparative studies. However, because of the wide disparity between the achievement of children educated in the secondary modern schools and that of children in selective grammar schools, it is apparent that a program separating children according to ability has, in the English situation, produced educationally desirable advantages for bright children and disadvantages for those less able. This situation poses yet another question for further investigation of classification as a means of educating all children: Is favoritism for the gifted child inherent in any and all selection and segregation practices, or has a successful medium using them as a means of educating children of varying abilities been found?

Concerning selection and segregation in English schools, two controversial assumptions can be made. First, average children are educated less well than the gifted because they are separated from the whole group or because equal conditions and parity of esteem are not granted them. Second, private schools provide better educations and have students of higher quality than state schools. The latter supposition seems highly doubtful, since, on the whole, merit determines who will win state scholarships, whereas places at private schools are still accorded to those children whose parents are of high social position and have sufficient funds to pay for their attendance at exclusive schools. On this basis it seems that a general academic superiority should be found in state

schools. Why this has not been the case as reported in this study seems to call for further research into the subject content and teacher quality of English private schools.

The test results, examined in another way, point up how English achievement compares with American standardized norms. Before this is done, however, it is necessary to take into account once again that the method of examination and the skills and knowledge being scrutinized are prescribed for American pupils and are not necessarily in keeping with corresponding English practices regarding examinations and subject-matter. What the evaluation does bring out, on a very limited scale, is a profile of accomplishment by both English and American students based on American standards.

BY EXAMINING the test results reported here, it is apparent that English students—selected, segregated, and trained as academically capable children—attained and equaled in all cases the level of performance expected of American students of comparable ability. In all probability the performance of English students would have shown an appreciable increase had the tests been of English construction and had they been more inclusive of subject-matter suited to the education in that country. Here the inference can be drawn that the aims in American comprehensive schools are generally set too low for academically talented children. American students of average ability, on the other hand, are somewhat ahead of their English counterparts. Children in the secondary modern school scored below the expected average achievement for American children.

The concluding hypotheses then can be stated in this manner. In England gifted children receive educations commensurate with their abilities, but average children are not as effectively trained; the balance of education is weighted in favor of one over the other as a result of historical developments and economic need. In American education the comprehensive school neither demands nor receives the most from the best; the balance of education is not achieved in that the needs of able children are not being fully met.

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How Confident Are Elementary-School Teachers about Teaching Science?

By LEWIS D. EVANS

Mr. Evans is associate professor of elementary-science education in the University School, Center for School Experimentation at Ohio State University.

CAN the level of confidence with which an elementary-school teacher approaches the teaching of science be raised by providing televised consultant help? This question arose in connection with planning the evaluation of a study sponsored by the Center for School Experimentation. This study, financed in part by the U. S. Office of Education under the provisions of Title VII of the National Defense Education Act, dealt with the effectiveness of television programs in contributing to both teacher and pupil learning.

In brief, it involved sending out at two-week intervals a series of ten half-hour telecasts designed both to stimulate pupil interest and to demonstrate to teachers how children can be helped to learn science. One hundred fifty third- and fourth-grade teachers within reach of the University's television station received the programs in their classrooms. The telecasts were not intended to be science "lessons"; rather they were designed to arouse pupil interest and educate teachers in the use of various methods of learning in science.

The present report is concerned with only one facet of the evaluation of the television series, that related to level of confidence among the participating teachers. In order to assess confidence, an instrument was devised in the summer of 1959 by two research assistants, Otho Perkins and Robert Gray, and tested with eighty-four teachers in graduate-school courses at Ohio State University. This instrument as revised was administered to the teachers participating in the study before and after the use of the television series in their classrooms.

Entitled "How Do I Feel about Teaching Science?"[1] the questionnaire is composed of eight science learning situations,

[1] A copy of the questionnaire may be obtained on request. Write to Lewis D. Evans, Center for School Experimentation, 29 W. Woodruff Avenue, Ohio State University, Columbus 10, Ohio.

which are representative of possible situations arising in an elementary-school classroom. Four of the situations are related to content in the biological sciences and four to the content and materials associated with the physical sciences.

Under each teaching situation, five learning activities are described, each of which can be placed into one of four categories: experimentation, observation, discussion, or reading. The total of forty items is divided equally among the four types of learning activities and between the biological and physical sciences. One situation is included here to demonstrate the nature of the instrument:

SITUATION D

Your fourth grade class is studying a unit on weather. The question is raised, "How does the weatherman know it's going to rain?" In looking at these possible activities, how confident would you feel about each?

16. Construct and use a model barometer or other equipment used by the weatherman.
17. Use science kit to conduct experiments to determine causes of precipitation, condensation, etc.
18. Encourage children to read in reference materials to find information about weather (books, magazines, weather reports, etc.).
19. Help the children design and follow through with a daily weather chart.
20. Form a committee to investigate the question further and provide a list of resource materials for committee use.

THE writer compiled data on the frequency of response of the participating teachers to each of the five learning activities in the eight learning situations before and after the telecasts. Their responses were made on a five-point scale: very confident (VC), moderately confident (MC), uncertain (U), moderately unconfident (MU), and very unconfident (VU).

In Table I the responses to Situation D are reported.[2] The medians show the relative level of confidence toward each activity before and after the telecasts and thus indicate changes in attitude toward their use as a consequence of the telecasts.

A test of significance was applied to these data to determine the probability of chance error and the levels of significance of the responses toward each learning activity. Of the forty items,

[2] Similar data for each situation may be obtained from the author.

in every case but two the probability of error was less than one in a hundred.

In interpreting any indicated changes, a median range within each category of confidence was established, and the tabulated

TABLE I

TEACHERS' RESPONSES TO "HOW DO I FEEL ABOUT TEACHING SCIENCE?" BEFORE AND AFTER TELECASTS

SITUATION D

ACTIVITY	FREQUENCY OF RESPONSE (Very Confident to Very Unconfident)					TOTAL FREQUENCY OF RESPONSE	MEDIAN	Z*
	VC	MC	U	MU	VU			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(16) Experiment								
Before	14	24	48	32	27	145	2.2	6.83
After	25	51	28	6	3	113	3.4	
(17) Experiment								
Before	17	40	39	33	15	144	2.6	12.60
After	27	64	19	2	1	113	3.5	
(18) Reading								
Before	48	58	31	7	0	144	3.5	5.33
After	73	32	7	1	0	113	4.2	
(19) Observation								
Before	65	54	23	3	0	145	3.8	4.98
After	84	25	4	0	0	113	4.3	
(20) Reading								
Before	26	43	49	20	7	145	2.9	6.67
After	43	54	15	1	0	113	3.7	

* Mann-Whitney U-Test corrected for ties. The Mann-Whitney test, although designed for independent data, was used here to permit utilization of all available data. The use of a median test for correlated data would have required that subjects for whom only "before" or "after" scores were available be eliminated. Thus all confidence levels are likely to be *underestimates* of the true value.

median response for each activity was related to it. The following median ranges were used:

Very unconfident	0.0— .9
Moderately unconfident	1.0—1.9
Uncertain	2.0—2.9
Moderately confident	3.0—3.9
Very confident	4.0—4.9

Thus, teachers responding to the activity D-18 indicate their relative feelings of confidence as being uncertain (2.6) prior to the study, yet moderately confident (3.3) following the telecasts.

Table II indicates differences in teachers' feelings of confidence toward biological- and physical-science activities. It is a

compilation of the median frequency of responses to the four types of learning activities before and after the telecasts. Inspection shows that *prior* to the telecasts, teachers felt:

1. More confident toward carrying on the four types of learning experiences in the biological sciences than in the physical sciences. The medians for the four types of activities in the former range from 3.3 to 3.6, in the latter from 2.5 to 3.2.

2. Least confident toward carrying on science experiments than any of the other activities in both the biological and physical

TABLE II

MEDIAN FREQUENCY OF RESPONSES TOWARD LEARNING ACTIVITIES BEFORE AND AFTER TELECASTS

LEARNING ACTIVITY	BIOLOGICAL SCIENCES		PHYSICAL SCIENCES	
	Before Telecasts	After Telecasts	Before Telecasts	After Telecasts
(1)	(2)	(3)	(4)	(5)
Experiment	3.3	4.1	2.5	3.3
Observation	3.6	4.1	2.9	3.6
Discussion	3.4	3.9	3.2	3.9
Reading	3.4	3.9	3.2	3.9

sciences. In the biological sciences, the median for science experiments is 3.3, in the physical sciences 2.5—the lowest for the various types of activities in both areas.

3. More confident about carrying on observation activities than any of the other types in the biological sciences.

4. Much less confident in the use of observation activities in the physical sciences than in the biological sciences.

5. A little less confident toward carrying on research reading and discussion activities in the physical sciences than in the biological sciences.

After the science programs, teachers felt:

1. More confident toward carrying on all four types of learning activities in both the biological and physical sciences.

2. Equally confident toward carrying on discussion and research reading activities in both sciences.

3. More confident toward experimental and observational activities than discussion and research reading activities in the biological sciences.

In summarizing these results, it is important to note the differences in the medians before and after completion of this series

in order to assess the degree of change in feelings of competence.

1. There was a general increase in confidence in carrying on all four types of learning activities in both the biological and physical sciences.

2. Gains are shown toward the use of experiments in the biological sciences: the degree of confidence as expressed by the median was moderately confident (3.3) before the telecasts, but shifted to very confident (4.1) afterwards. (However, the significance of the difference in the medians was not tested.) Teachers also felt more confident toward carrying on experimental activities in the physical sciences, the change being from uncertain (2.5) to moderately confident (3.3).

3. While teachers felt more confident in encouraging observation activities in both the biological and physical sciences, the amount of gain in the physical sciences—from 2.9 to 3.6—is apparently greater than in the biological sciences—3.6 to 4.1.

4. Teachers also showed increased confidence toward discussion activities; gains were about equal in both the physical and biological sciences.

The specific learning activities under a given teaching situation should be examined in order to assess more accurately the differences in feelings of confidence between the biological and the physical sciences. Scrutiny of the various items shows that many involving the use and manipulation of materials and simple science equipment were rated lower than those which did not.

For example, activity experiment D-16 (involving the construction of simple weather instruments) shows that teachers felt quite uncertain (2.2) as to the implementation of this activity in the classroom, yet responded as feeling moderately confident (3.4) after the completion of the science programs. This seems to indicate the need to explore and understand the use of these resources in carrying on certain types of learning activities in science.

TABLE III indicates the level of confidence of the participating teachers toward the four learning situations as associated with biological science and with physical science before and after the telecast series. The table presents the number of teacher responses made to each of the five levels of confidence for each learning situation, the total frequency of response for the situation, and the median.

TABLE III

Summary of Teachers' Responses toward Biological- and Physical-Science Activities before and after Telecasts

Biological Sciences: Learning Situation	Before*							After**						
	Frequency of Response (Very Confident to Very Unconfident)					Total Frequency of Response	Median	Frequency of Response (Very Confident to Very Unconfident)					Total Frequency of Response	Median
	VC	MC	U	MU	VU			VC	MC	U	MU	VU		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	265	312	109	28	8	722	3.6	319	201	39	3	3	565	4.2
B	130	231	219	102	39	721	3.0	182	239	123	20	1	565	3.7
C	350	248	85	30	7	720	3.9	390	151	22	2	0	565	4.2
F	161	294	199	56	13	723	3.3	238	238	85	2	2	565	3.8
Total ...	906	1,085	612	216	67	2,886	3.5	1,129	829	269	27	6	2,260	4.0
Physical Sciences: Learning Situation	**Before***							**After****						
	Frequency of Response (Very Confident to Very Unconfident)					Total Frequency of Response	Median	Frequency of Response (Very Confident to Very Unconfident)					Total Frequency of Response	Median
	VC	MC	U	MU	VU			VC	MC	U	MU	VU		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
D	170	219	190	94	50	723	3.0	252	226	73	10	4	565	3.8
E	152	240	198	99	34	723	3.0	216	229	102	18	0	565	3.7
G	193	235	166	73	56	723	3.2	271	188	79	19	8	565	3.9
H	103	149	168	150	151	721	2.7	187	176	115	54	33	565	3.4
Total ...	618	843	722	416	291	2,890	2.9	926	819	369	101	45	2,260	3.7

* Number of teachers responding = 145
** Number of teachers responding = 113

The Kruskal-Wallis statistical procedure was applied to the data to determine the probability of chance error and the level of significance of the responses toward each teaching situation. In every situation in both the biological and physical sciences, the probability of error was very much less than one in a thousand.

An examination of the medians of the responses shows that the participating teachers apparently:

1. Increased in feelings of confidence toward all the learning situations associated with the biological and physical sciences.

2. Felt less confident toward working with learning situations in the physical sciences (2.9) than in the biological sciences (3.5) prior to the science telecasts, yet after their completion showed greater over-all changes and gains in feelings of confidence in the physical sciences (2.9 to 3.7) than in the biological sciences (3.5 to 4.0).

3. Varied in their feelings of confidence toward working with different learning situations in either the biological or physical sciences; the over-all differences were somewhat greater in the biological sciences, especially before the science telecasts.

These observations are consistent with the previously reported results. It cannot be assumed, of course, that the reported gains are due only to viewing the television programs. The activities initiated through the programs gave many teachers added experience in teaching science and, therefore, helped effect changes in feelings of confidence. The fact that teachers did try to broaden their experience and derived satisfaction from their own activity in following up the leads provided by the television programs has been previously reported. It should be noted that no direct attempt was made to duplicate any of the specific learning activities described under each of the teaching situations of the attitude questionnaire, although constant reference was made to use of the four ways of learning in problem-solving situations.

The telecast series seems to have had a direct influence in developing teachers' feelings of confidence toward the various kinds of learning activities in both the biological and physical sciences. The Center for School Experimentation is now organizing another study in this area. The Elementary Science Study, as it is to be called, will be concerned with evaluating a variety of approaches to in-service education in elementary science.

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** Number of teachers responding = 113

A New Development—Mechanized Information

If you are active in, or otherwise interested in, the field of educational research, you are probably finding it more and more difficult to assure yourself that you are keeping up-to-date on current developments. If you are at all typical, you are probably trying to scan an inordinate number of periodicals and reports in order to locate those articles and discussions that really interest you.

The U. S. Office of Education is supporting a pilot study to develop and put into operation a mechanized information retrieval system. The study, being conducted at the Center for Documentation and Communication Research at Western Reserve University, has as its ultimate objective to provide information on everything currently being published anywhere in the world relating to specific areas in educational research.

To pretest the system, the researchers want persons in the field to submit questions so that they may determine representative subject-matter and also the degree of selectivity that may be required. Those working on the project have set up some examples of alternate ways in which questions might be phrased, so that they would provide a broader or narrower selection of the literature in a specified area. For example:

1. Send me everything published on "concept formation."
2. Send me only those materials which discuss "concept formation" in young, mentally retarded children.
3. Confine my question to "concept formation" in young, mentally retarded children as an indicator of educability.

Please phrase all questions as if you were actually requesting information and address them to:

Professor Allen Kent, Associate Director
Center for Documentation and Communication Research
School of Library Science
Western Reserve University
Cleveland 6, Ohio

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EDITORIAL COMMENT

Schooling for the Mind and Heart

> The purpose which runs through and strengthens all other educational purposes—the common thread of education—is the development of the ability to think. This is the central purpose to which the school must be oriented if it is to accomplish either its traditional tasks or those newly accentuated by recent changes in the world.[1]

DEVELOPING the ability to think has been the prime stated objective of education from time immemorial. Providing facts has historically been the principal preoccupation of schools, on the ground that facts are the stuff with which to think and therefore must be acquired before thinking is possible. Schools in the modern democratic tradition, however, have gone a step further. By examining the miscellany of facts and information available, they have attempted to set up curriculums which will help people develop the many facets of their natures. Such schools are directed toward the goal of producing free men and free societies.

We are far from sure exactly how people learn to think, but our experience shows fairly clearly that they do not learn very much of the information commonly organized in school programs without thinking in the process. Furthermore, they do not become good citizens, successful in the personal relations of home and community, without learning to think effectively about those matters.

The Educational Policies Commission has performed a great service for education by reopening the matter of the place of thinking in the school program. This, together with the problem of how to teach thinking, is discussed in its recent short monograph, *The Central Purpose of American Education.* The Commission recognizes that at best the school can only help the individual to attain his highest possible level of achievement and society to achieve freedom; it cannot guarantee those results. The school can encourage rational thought toward those ends by creating favorable conditions such as concern for the attainment of

[1] Educational Policies Commission. *The Central Purpose of American Education.* Washington, D. C.: National Education Association, 1961, p. 12.

mental and physical health, attention to the personal difficulties of each pupil, and recognition of the uniqueness of each individual. It can create an atmosphere of respect for thinking and it can reward gradually emerging successes of the student.

No single subject of study can magically produce a thinking person, not even mathematics. Many subjects have potential value for this purpose—even music, art, and the practical and vocational subjects. The social and humanistic studies have especial promise. The key to the matter lies in learning how *to know*—the strategy of inquiry, with respect both to the objective world and to the nature and place of man in the scheme of things. Training the individual to use his mind to become a good person and a contributing member of a community should be the central objective of school education.

The one vulnerable point in this analysis lies in the matter of motivation and the choice of commitment and allegiance in the individual's life. To say that thinking helps one to achieve his goals, even to refine them and to understand them, is enormously important, since this idea is still on the frontier in many schools. But the question remains as to how people choose what they want to be, what values they will really try to live by. To say that these values are learned is true, but not entirely illuminating. To rely upon thinking and the sophisticated perfection of the rational powers is possibly the best course that we know, but it is embarrassingly insufficient. Eichmann seems to be a pretty keen thinker, but for evil purposes. France has long stressed intellectual activity in its schools, but today it is throttled by nihilism.

We are left with two great tasks yet unfinished in designing school programs. One is to make learning to think, rather than merely stuffing heads, a major creative purpose in our classrooms. The other is to address ourselves candidly to the question of how to help people choose high purpose, rather than merely to go with the crowd. Possibly doing the former task well can put us in a better position to do the latter one, but we dare not be sanguine about it.

DONALD P. COTTRELL
Dean, College of Education

The Proposed MPATI Research Study

As announced briefly in the Editorial Comment of the last issue of the Bulletin, the Midwest Program on Airborne Television Instruction has contracted with Ohio State University for evaluation and research in connection with the airborne instructional telecasts which will be carried on during the 1961–62 school year.

The work proposal, drafted by I. Keith Tyler, Director of Institutes, Workshops, and Seminars for the Telecommunications Center, and Egon Guba, Director, Bureau of Educational Research and Service, is the outcome of the deliberations of an informal committee which has been meeting at Ohio State for several months. The committee membership includes persons from the Departments of Education and Sociology, the Bureau of Educational Research and Service, the Telecommunications Center, the MPATI field office, the Research Division of the State Department of Education, and the Research Division of the Ohio Education Association. The interdisciplinary character of this group is reflected in the proposal and will undoubtedly cause the study to be developed along broad lines.

Two separate inquiries will be undertaken: (1) the impact of television teaching upon the role of the classroom teacher, and (2) the economic efficiency of televised instruction. The role of the classroom teacher was chosen for study because it appears to be the most important area of impact from a number of points of view. Many thoughtful critics of the Program and of educational television in general have been viewing with alarm what they consider to be a degradation of the teacher's role by automated education. This problem was designated as vital at the original conference on research and evaluation called by the MPATI central staff in August, 1960. It was stressed by Warren Seibert, then head of the Research and Evaluation Office of MPATI, as a basic problem in his televised "Evaluation" interview presented before the MPATI Workshops during the summer of 1961. The television presentation given at these workshops, "The Role of the Teacher," was overwhelmingly rated as most helpful by both participants and directors.

The over-all economic efficiency of using MPATI was selected as a second problem, because its evaluation will afford

guidance to schools, colleges, and laymen as to whether instructional television is worth the cost. It should also be helpful in reconstructing the educational organization and plant for greatest efficiency without loss of quality.

The study will be conducted throughout the six-state MPATI area, which includes Wisconsin, Michigan, Illinois, Indiana, Ohio, and Kentucky. In general, projections call for the research to be carried out in four phases: (1) development of a conceptual framework and appropriate instrumentation, (2) selection and training of field workers and selection of an appropriate sample of co-operating schools and teachers, (3) collection of data, and (4) analysis and reporting. The four phases will correspond roughly to the four academic quarters of the University year, beginning Autumn Quarter, 1961, and ending Summer Quarter, 1962. A sampling of teachers and schools actively using MPATI programs will be chosen for study; geographical, socioeconomic, rural-urban, and educational factors will be considered in making the selection. A control sample similar in all respects to the experimental group except that they will *not* be receiving MPATI telecasts will also be chosen.

Ohio State University is pleased to announce the appointment of Clinton A. Snyder as project director. Mr. Snyder is well qualified by training and experience for this post. He has recently completed the requirements for the Ph.D. at Michigan State University in educational sociology; his doctoral dissertation was concerned with the role of the secondary-school teacher. Since 1956 he has been a member of the Social Science Department at Michigan State, teaching an interdisciplinary course in social science and selected courses in sociology. He is currently serving as Community Study Director (Detroit) for that University's Student Teacher Experimental Project. His early training and secondary-school teaching experience were in the physical sciences. Mr. Snyder will be on leave of absence from Michigan State during the term of the project.

THE areas which have been selected for study are, of course, only two of many that might have been chosen. Indeed, an over-all "map" of possible research in the field of televised instruction, as given in the MPATI proposal, might consist of the following:

1. Student Learnings
   a. Process: looking and listening analysis comparable with reading research
   b. Product: conventional content achievement
   c. Product: concomitant learnings (attitudes, values, etc.)
2. Curriculum and methodology
   a. Curriculum adaptations
   b. Curricular autonomy—local and state
   c. Pupil action, reaction, and interaction (i. e., self-study; individual reaction to teacher, television, etc.; and interaction with other pupils)
   d. Classroom methodology
3. Professional roles
   a. School administrator
   *b. Classroom teacher
   c. Studio teacher
   d. Pupil
   e. Television specialist (e.g., director)
4. Organization and structure
   *a. Over-all economic efficiency (i.e., costs related to quality and to restructuring and redeployment)
   b. Scheduling
   c. Equipment installations
   d. School construction and remodeling

* Subject of the present research.

Even a cursory glance at this list will indicate how many problem areas remain untouched by the proposed research. The message of the Editorial Comment in the last number of the BULLETIN thus retains its validity despite the developments that have taken place since it was written. Local school systems are still the vital link in any massive research or evaluation program.

The Bureau of Educational Research and Service will therefore continue to proffer assistance in connection with any research or evaluation project which a local system might wish to undertake, and will be happy to publish in the BULLETIN data resulting from such projects. The fact that some central research will be undertaken makes it more important, rather than less so, that school systems should engage in studies at the local level.

EGON G. GUBA

READINGS

Books to Read

GOOD, H. G. *The Rise of the College of Education of The Ohio State University*. Columbus, Ohio: College of Education, Ohio State University, 1960. viii + 306 pp.

On April 18, 1907, the College of Education of Ohio State University was formally established by the Board of Trustees of that institution. This action followed passage of an "enabling act" by the state legislature on April 2, 1906. Part of a long overdue program to provide state-supported training of teachers for Ohio's public schools, the new college was in large measure the product of the farsightedness of President William Oxley Thompson, who saw significance in the preparation of teachers in universities rather than in separate normal schools or teachers colleges. "Such a college in a university," he believed, "would be stimulated and nourished by the scholarly work in all fields—in letters, science, and the arts—which was carried on in the university departments and divisions" (page 33).

On the heels of the semicentennial observance of the founding of the College, H. G. Good has written an eminently readable account of the rise of this College to the position of consequence and service to the state, the nation, and the world which it enjoys today. The author, for many years a professor of education in the College, has traced its development through the administrations of five deans and innumerable curriculum committees, with frequent, commendable concern for the contributions, both extra- and intramural, of his colleagues. He has noted the origins of the niggardliness of the Ohio legislature in appropriating funds for support of its institutions of higher learning, the significance of summer-session programing in the evolution of the College, the early contest with Ohio and Miami Universities over the extent of their educational curriculums, and the vain efforts to establish the College as the actual head of all teacher preparation in Ohio.

Professor Good's treatment of the origins and impact of the Ohio Psychological Examination, the now defunct Ohio State Educational Conference, the Ohio Conservation Laboratory, the Bureau of Educational Research, and the EDUCATIONAL RESEARCH BULLETIN should be of interest to a wide audience both in the state and beyond.

At the same time, readers may find it difficult to understand why the Department of Psychology is still administratively housed in the College of Education years after the passing of George F. Arps, or why the School of Fine and Applied Arts and the School of Music have similar shelter.

The reader will likely chuckle when he notes that academic respectability was achieved for the post–World War I curriculum in health and physical education through the infusion of massive doses of science courses

in anticipation of the "probable charge that here was another invasion of the academic fortress, another easy avenue to a University degree. Dean Arps often declared that the physical-education program was one of the most difficult of the curriculums offered by the College" (page 127). Then, at the bottom of the same page, the reader will find the outcome of this infusion: "Very soon the Department moved to modify the curriculum by reducing or eliminating some of the requirements in languages, anatomy, physiology, bacteriology, and professional education. The reasons for the changes were explained a few years after the new curriculum had been established by Professor J. H. Nichols, who was head of the men's [physical education] division. He wrote . . . The theoretical and ideal must be reconciled with the practical needs of the work" (pages 127–28).

The book is relatively free from error. The only conspicuous exceptions noted by this reviewer occurred on page 175, where it is made to appear that Martin L. Davey was Ohio's governor in the *early* 1930's, and on page 234 where reference is made to American Samoa as having had a Spanish-Catholic civilization. A question of definition arises when Professor Good, in commenting on the publication record of faculty members of the College of Education, defines as "books" all "separate publications of twenty or more pages that are written in continuous prose—not mere tabulations, not magazine reprints, and not publications merely edited or revised by faculty members" (page 248). Certainly many professors on campuses where "publish or perish" is a cardinal principle would be interested in administrative acceptance of twenty-page "books."

But these minor criticisms cannot deny the substantial merits of the sound professional history prepared by Professor Good. He and the College of Education are to be commended for good work, well done.

PHILLIP R. SHRIVER
Kent State University

RUSK, ROBERT R. *An Outline of Experimental Education*. New York: St. Martin's Press, Inc., 1960. viii + 118 pp.

In this short historical survey, Mr. Rusk summarizes his reasons for believing that experiments in education are both possible and essential. To illustrate, he enumerates researches which were historically important in the development of solutions to various kinds of problems in education.

Early chapters offer philosophic evidence that experiment has long been used to effect educational changes. The author examines the attributes of good experiments. He suggests that modifications of the designs and methods used in the physical and social sciences are necessary before utilizing these experimental models to treat educational problems and that unique plans and techniques must be devised, although these are not specified. He merely contends that more experimentation in education must be done and that it must be more rigorous, systematic, and deductive in order to build the needed science of education.

Later chapters present studies deemed important in subfields of education. Sections deal with the curriculum, school organization, buildings and equipment, educational method, the learning process, and discipline. His thesis is that the classroom is both a proper and vital locus for experiment, a view already well received among United States educators.

Citations range from studies undertaken in the early nineteenth century to recent projects of contemporary researchers. The references, which are about equally divided between British and American research, reflect wide acquaintance with writings in the author's field, plus an awareness of related psychological, sociological, and philosophical publications.

The book's stated purpose is to provide complementary readings in educational psychology for students of education and to raise issues of importance to education which can be solved by experiment. Unfortunately, it falls far short of these goals. Nor does it achieve its book-jacket claim of being valuable to the general reader. The details of studies reported are woefully lacking, and there is no analysis or evaluation.

The omission of explanations of terms used in technical context will curtail the book's utility for students and laymen. The researcher will find it difficult to profit from unsupported, vague statements of criteria for good design, adequate method, proof, and control, and may reasonably object to equating experiment with innovation. Equally suspect is Mr. Rusk's consistent implication that experiments must be issue-centered and solution-giving. Psychologists and many educators will object to his undefended statement that, until psychologists resolve their theoretical differences, they cannot usefully contribute to education (page 88). Throughout the book, he maintains a distance from his subject which does not permit logical analysis and exploration of alternative positions and evaluations. He avoids comparisons. Even as a survey the book is inadequate, leaving important gaps in the history of educational research—for instance, the omission of the controversy of the *verstehen* versus the positivistic method. In short, the little knowledge found in this book can be a dangerous thing.

G. E. SHARPLES

HENRY, NELSON B., editor. *The Dynamics of Instructional Groups: Sociopsychological Aspects of Teaching and Learning.* Chicago: University of Chicago Press, 1960. xii + 286 pp. (Fifty-ninth Yearbook of the National Society for the Study of Education, Part II).

MILES, MATTHEW B. *Learning to Work in Groups: a Program Guide for Educational Leaders.* New York: Bureau of Publications, Teachers College, Columbia University, 1959. xvi + 286 pp.

Together these two volumes may be taken to represent the apex of interest in the group-dynamics movement. A wide variety of approaches to the systematic study of groups is represented in the Yearbook, while the Miles book stands as an example of the practical applications to be drawn from the fifteen years of attention the movement has had in American education.

After a fifty-page introduction, notable for an attempt by Max R. Goodson to reconcile the older group-dynamics movement with renewed concern for individual development, *The Dynamics of Instructional Groups* is divided equally between reports on theoretical frameworks and summaries of studies that may relate to classroom needs.

The theoretical section includes contributions by Jacob W. Getzels and Herbert A. Thelen, Gale Jensen, Jack R. Gibb, Jay M. Jackson, and David H. Jenkins. For some readers, the special vocabularies of these writers will interfere with comprehension of their ideas. The systems or models proposed do indicate the rigorous effort that has gone into developing viewpoints for use in refining present knowledge of group structure and process.

Contributors to the section on "The Diagnosis and Guidance of Instructional Groups" may have been handicapped by what William C. Morse identifies as the paucity of classroom-centered research and the variability among those groups that have been studied "as to types of activity, size of class, age of pupils, and the nature of teacher leadership" (pages 226–27). However, Morse's chapter on individual and group relationships and Ned A. Flanders' on classroom social structure should suggest to teachers many new ways of looking at instructional problems.

In a closing chapter assessing the implications of the Yearbook, Willard C. Olson returns to the basic issue of relating individual and group. He points out that while the Yearbook succeeds in "its goal by redressing the balance," there remains the task of developing the "more encompassing theory and practice" that will bring individual and group together (page 280).

A publication of the Horace Mann-Lincoln Institute of School Experimentation, *Learning to Work in Groups* is an unpretentious guide for leaders who wish help in "improving the group skills of people in a concrete way" (page 7). The core of the book is an eighty-page chapter that covers "25 broad types of training activity and 115 specific examples" (page 96), indexed both in terms of problems—agenda-building, chairman's role, decision-making, and so on—and activities—alter-ego comments, case analyses, experimental demonstrations, and the like. A concluding chapter on evaluation is also highly specific, presenting in particular many devices for checking on member satisfaction with group experiences.

In a sense, Miles summarizes the insights and the procedures developed during the early 1950's when he points out the widespread concern for helping groups function more effectively through becoming more self-conscious. By repudiating control of others as a goal and recognizing therapy as being beyond his present purpose, he steers clear of two of the byways of the movement. At this point, the continued separation of skill development from real working situations may seem open to question. Yet even the person who believes that skills in this area as in others are best developed as they are needed may get ingenious new ideas as well as many tested procedures from this book.

With the current interest in thinking through new conceptions of individual learning, social adjustment, and creativity, the 1960's may see less attention given to the group process as such. In that event, these two books may remain as summaries of the achievements of the group-dynamics movement. If the broader base for relating the individual and the group that Olson advocates is forthcoming, then the books will have contributions to make toward the new synthesis. In either case, they should be assured an appreciative audience.

ALEXANDER FRAZIER

BARKAN, MANUEL. *Through Art to Creativity: Art in the Elementary School Program*. Boston: Allyn and Bacon, Inc., 1960. xiv + 366 pp.

This is a book written for classroom teachers and art teachers at the kindergarten and elementary-school levels. Its main purpose is to show how classroom teaching can effectively stimulate creativity.

Many excellent books propounding the theory of child art have been written in recent years. Also much has been written about the necessity of stimulating the imagination and the expression of latent knowledge; it is now conceded by most educators that a teacher who has developed his own creative ability and aesthetic awareness will be the more effective teacher.

To my knowledge, Mr. Barkan is the first to write a book using tape recordings of direct dialogue between the teacher and the children. This method answers the constant question coming from my own students, "What do you say to children in the classroom?" The main body of the book, Chapters III to IX, is a report, both verbal and photographic, of actual classroom procedure, giving tape-recorded discussions carried on by the teacher and the pupils. Included in this section are classroom records and analyses of the discussions. For those prospective teachers who have limited opportunities to do practice teaching and to observe student-teacher interchange firsthand, the dialogues presented are invaluable. These include many step-by-step explanations of art techniques.

The summation in Chapter X, "What is good teaching of Art?" sets down very lucidly the role which the teacher must play and asks the question, "Who should teach Art in the Elementary School?" The book also contains an excellent bibliography.

I enthusiastically recommend *Through Art to Creativity* to all teachers of young children.

GERTRUDE METCALF
Antioch College

RECENT PUBLICATIONS

OF THE COLLEGE OF EDUCATION

Toward a Democratic Education.

By H. GORDON HULLFISH. x + 90 pp. $2.00.

This is a collection of six lectures delivered by Professor Hullfish when he was a visiting Fulbright lecturer in Japan. The Japanese edition was issued in commemoration of the John Dewey centennial.

The Larger View of the University.

By LOUIS M. HACKER. The Boyd H. Bode Memorial Lectures, 1960. viii + 52 pp. 1961. $1.00.

A noted professor of economics discusses higher education in America. His lectures are entitled "Problems and Challenges" and "Attitudes and Policies."

"I Can Read It Myself!" Some Books for Independent Reading in the Primary Grades.

By FRIEDA M. HELLER. Study of Independent Reading, Bulletin I. iv + 31 pp. $1.00.

The librarian of the Ohio State University School has prepared an annotated list of books arranged according to three levels of difficulty.

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Exploratory investigations of problems arising when children in the first three grades choose their own reading materials.

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